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Fusing art and science

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Fusing Art and Science

A Look into the Glass Art of Steven Tippin

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ABSTRACT

In this thesis, I will demonstrate how I incorporate scientific theory to produce varying aesthetics in my artwork. By discussing the foundations on which I have built this notion, in addition to my childhood interests, I will assert that my artwork is firmly grounded and entrenched in my interests in both science and art.

THESIS STATEMENT

I create very thin, flat glass panels made by melting individual glass components into a single larger panel at temperatures around 1,650° Fahrenheit (900° C). The components that I fuse together form a visual pattern, which I manipulate to achieve a false visual depth by creating foreshortening, size and tonal change and overlapping. The panels are physically very thin (around ¼") but I am able to yield a false visual depth that appears to be greater than the physical dimensions of the piece. The work is easily compared to and inspired by other media that seem to visually push beyond their two-dimensional restrictions such as drawing, photography, printmaking and painting.

Currently, the work has been restricted to its two-dimensional nature when displayed. The relationship between my artwork and viewer is similar to the relationship between viewer and painting in that the viewer stands in front of the object, views it and understands it. This relationship is easily understood from one static position even when the work visually seems three-dimensional. The perceived depth is created as the viewer reacts to the basic cognitive information within the artwork that confuses the viewer into perceiving a false depth. In an earlier attempt to go beyond this simple and static relationship, I juxtaposed two panels at different angles, in an attempt to create a more complex relationship with the viewer. While this change offered additional viewing positions beyond the simple single plane, it had limited success. The juxtaposition changed the easily understood flat panel to two flat panels at two tangential planes, but did not truly reach into a third dimension.

In my thesis, I will challenge the conventions of display by removing the restrictive characteristics of the flat, two-dimensional work that I have displayed to date. To do this, I must first free the work from the traditional conventions of display and from its two-dimensional restrictions. The goal is to interact with the viewer in a more encompassing way with the work. I will bring my work in to a third dimension, allowing viewers to not only interact visually with the artwork but also envelope them within the artwork. I want to have the viewers walk around the work as much as I want to have the work walk around the viewers.

- August 10, 2009

INTRODUCTION

The body of my artwork is made up of glass panels created by controlling scientific variables such as viscosity, mass, density, gravity, size, time, and using these variables to produce an aesthetic inspired by black-and-white photography, painting and drawing. By fusing my interests in science and art, I have been able to experiment with the phenomenology of glass to produce a visual experience that surprises viewers and forces them to consider the difference between actual and perceived depth.

I will never be a scientist. I will never be able to explain the things that I know to another person in universal terms and measures in a way that leaves them without question. My version of science is a logic-based structure that has been gained through experience that makes perfect sense to me. I understand what I understand but find it difficult to explain to others having no formal training in science.

My interest in science began at a young age. Growing up, I found great pleasure and comfort in the methodical reasoning upon which science and mathematics are built, but always found the formulas and terms to be foreign and unusual. I respect mathematics for its universal truths but found that I lacked the focus needed for anything more complex than basic mathematics. Growing up I found that science and I did not always agree but I recognized that my brain functioned in a concise and methodical manner, similar to the systems used to organize the world scientifically.

For as long as I can remember, I have always been interested in patterns and repetition. As a child, I would spend time trying to find patterns in seeming randomness such as the grain of wood paneling or try to find matching stones at the beach. I would attempt to organize and classify everything I encountered, particularly new things, in an attempt to better understand and seek comfort in the familiarity of patterns. As my interest in patterns developed, I began to look less at the aesthetic qualities of the patterns alone and more to the structure and systems with which people organize the information contained in patterns. My earnest interest in the process to classify information and the presentation of information in the form of patterns has led me to pursue this interest evenly in science and art, in my artwork, and are passions that I explore throughout my thesis work.

In science, every thing on earth, whether living or not, is separated and organized using a system of classification by which scientists arrange all things into groups based on their shared characteristics. Classifications for living things, for instance, are separated into categories of: domain, kingdom, phylum, class, order, family, genus, and species. As a young child with interests in science, I too developed classifications to bring more order to the things in my life.

One such example is how I tried to understand the grown-up act of reading newspapers. I was drawn to the ritual involved in reading a newspaper however, I was a child who could barely read, let alone understand its content; but this did not stop me. To make this unfamiliar domain more commonplace, I look for the patterns. Only then was I able to create a system to organize and classify the information within the patterns.

While the average newspaper reader might see a newspaper as divided into typical sections defined by the newspaper industry, such as Sports, Travel and Life, with pages in each section and articles on each page, I saw newspapers classified into section, page, article, paragraph, sentence, word, and letter; however, I have always also been captivated by the patterns that the words make up on a page and the patterns of the spaces between them. This became an almost Morris Code of binary information of either 'ink' or 'no ink', 'black' or 'white', 'positive' or 'negative'. My system of categorization wasn't limited only to font type, I also recognized that newspaper photographs were made up by halftone images in which a grid of varying sized circles is used to show a seemingly infinite range of tone between ink and page. This may not be a typical way for a child to experience a newspaper, but I found that I was able to understand the organization of a newspaper long before I could understand the content of the articles. This made newspapers more accessible to me, as a young child, and gave me a higher level of comfort with this ritualized, adult-oriented medium.

BACKGROUND

As a classifier and organizer by nature, I have a keen interest in science; but my interest in patterns and aesthetics led me to study art. When I was nearing high school graduation I was divided about what to study in university. I convinced myself that Art History was the best compromise to satisfy my interests in both science and art. However, during a mandatory first-year printmaking survey course, I discovered that there was a vast collection of techniques in printmaking that satisfied my process-driven need for classification and categorization. This fuelled a desire to learn and master each technique of printmaking available to me: lithography, wood cut printing, intaglio, serigraphy. As a result, I changed my major from Art History to Studio Art and enrolled in as many printmaking courses as possible.

Serigraphy (the process of silk screening) has a fast, graphic quality that allowed me to experiment quickly with a relatively simplistic process that still offered room for structural thinking about imagery, the ability to reproduce information, the division of information into separate layers, question the boundaries of dimensionality, and also the opportunity to experiment with controls and variables with nearly exact copies to which the results could be compared.

Each information layer was made by forcing ink through a stretched screen made of silk, or similar woven fabric, with a squeegee to deposit it onto a surface. By controlling which of the spaces of the fabric are open and which are blocked with an impermeable substance, the ink only passes through the mesh in controlled locations. Where the screen is open, ink passes through the fibers of the woven mesh and onto the substrate and creates the image. I approached the binary process of serigraphy similarly to the way in which I recognized and categorized the positive-and-negative information of ink on newsprint. In order to produce a multiple color image, the printer must separate the image into layers of individual color and print them one over the other to create the multicolored image. Printmaking also allowed me to print multiples of the same image, called an edition, which I could use to compare the direct results of experimenting with the process. Since the image is broken up into different layers, I was able to easily categorize the process and think of it as a three-dimensional media similar to the way in which an exploded technical diagram is two dimensional and requires the viewer to think in three dimensions to fully understand it. Throughout my university studies, I began to think of the layers in printmaking in a manner similar to the 3-dimensional realm of sculpture, which has laid the foundations for my interest in depth through layers and dimensionality, and furthered my knowledge and fascination with the repetition of imagery to create a pattern and systems by which to organize patterns.

While I enjoyed the process of printmaking, it still lacked the more formal foundations of science in which I was interested; I found that I was forcing it to fit. Armed with an undergraduate degree in Studio Art, I enrolled in the Glass program at Sheridan College to push myself to continue exploring these notions. I quickly learned that I had found my perfect mix of science and art in glass. The process easily lended itself to scientific experimentations by isolating and changing the process and the aesthetic qualities of glass were also very interesting.

PROCEDURE

Over the course of my studies at Sheridan, I was taught many different techniques in glass. I started in the glassblowing studio (also called a hotshop), working hot glass at the end of a blowpipe but found that the process of blowing glass allowed for too much variation in the finished product. It was nearly impossible to recreate an object identically and this was discomforting for a printmaker accustomed to reproducing the same product as a control group used for experimenting and comparing results. By my senior year at Sheridan, I was looking for even simpler and more consistent data with which to experiment. I gravitated to kiln-formed techniques and eventually removed the mold altogether to create a thin layer of glass made by melting components known as murrini, which is made from cane. In March of 2007, I was first exposed to techniques for making cane while studying hot glass techniques at Sheridan with instructor Blaise Campbell. All cane begins by the glassblower 'gathering' or preparing a metal rod with glass by dipping it in a furnace containing molten glass, repeatedly building up

more glass with each gather. After the desired amount of glass is attained, the hot glass is then shaped, cooled and heated until uniform in shape and temperature. Simultaneously, an assistant prepares a 'post', which is another rod with a flared, horn-like platform of solid, clear glass on the end. The heated and shaped glass is then connected to the flared post, and both glass workers walk away from one another, each with a rod, stretching the glass into one long cane as they separate. Changing the shape or color of the core or any of the subsequent layers can change characteristics of the cane and could result in an infinite number of variations. The canes of glass are then cut into roughly 1" lengths, which are called murrini.

Traditionally, cane and murrini are used to make complicated surface adornments for vessels. This is done by creating patterns of short lengths of cane (4-6") or murrini (1/2") and heating them until they begin to melt, adhering them together to create a layer of glass. The tip of the blowpipe is then rolled along one end of the layer, adhering the two hot, sticky surfaces as they touch. The rolled-up layer can be heated further until soft enough to shape and form a vessel using the traditional glassblowing techniques. My approach is slightly different from this.

I create very thin, flat glass panels made by melting murrini arranged on a flat melting in a kiln at temperatures around 1,650° Fahrenheit (900° C). The simplified murrini components that I fuse together are arranged in a specific pattern, which is used to achieve visual depth. The panels are physically very thin (around ¼" or 6mm) but yield a false visual depth that appears to be greater than the physical dimensions of the piece. The work is easily compared to other media that seem to visually push beyond their two-dimensional restrictions such as drawing, photography, printmaking and painting.

EXPERIMENTATION

I began experimenting with murrini immediately after learning the technique in 2007. I was curious to experiment with and compare results of a process that could be complicated by nearly infinite variation. In order to do so, I first needed to simplify the process. I removed all extraneous information in an attempt to create a control group to make the resulting variables easier to identify. I did this by first removing the distraction of color, working only within the grey tones between black and clear glass. After trial and error and experimentation, I also decided not to roll up the fused murrini layer onto the blowpipe to make a vessel, as the shape and size of the vessel too often distracted from the final resulting pattern. I decided to no longer make functional glassware in the traditional sense; rather, I created flat panels of glass. The information, in the form of flat, colorless glass panels, was clearer to see and easier to analyze. It was an important first step towards the simplification and classification of my work.

Through experimentation, I learned how to control almost every condition in my process, which allows me to isolate and alter certain factors and readily see the resulting change on the final product. This scientific approach to making the glass

allowed me to experiment while learning the material in order to better understand its phenomenology and learn how to work with the glass to achieve my desired outcome. This in turn revealed an entire vocabulary of ways in which to create my murrini work in a way that balances science (the physical properties) and art (the aesthetic properties). The body of my artwork is made up of glass panels made by controlling variables such as viscosity, mass density, gravity, time, and arranging the murrini in accordance to their color density and size in order to produce perceived depth.

Viscosity

At any given temperature, glass has a specific viscosity as it is heated from a solid to a liquid. Viscosity is the measure of the resistance of a fluid that is being deformed by either shear stress or tensile stress. In everyday terms (and for fluids only), viscosity is "thickness" or "internal friction". Thus, water is "thin", having a lower viscosity, while honey can be considered "thick" comparatively, having a higher viscosity. Put simply, the less viscous the fluid is, the greater its ease of movement. (Symon) It is this transformation of state, from solid to liquid that allows the modular units of murrini to flow and connect to form a single piece of glass. The viscosity of the heated glass can be consistent and varies only with the temperature of the material, and as such, the heat and the resulting viscosity can also be used as either a control or variable when making my glass panels.

The consistent and predictable viscosity, or resistance to flow, inherent in the glass allowed me to isolate and compare the results of other variables such as gravity and density of mass. Once glass is a liquid, its viscosity and surface tension dictates that it collects and pools at a depth of roughly 1/4" (6 mm). This consistency allows for a difference in arrangement of mass density to act either as a variable or as a control. If an area of murrini creates a higher density of mass as a liquid, it will flow outward to realize this 1/4" depth dictated by its viscosity and surface tension. If the mass density is low, the edge of the glass pulls inward to build up the mass needed to acquire this depth. To simplify, imagine one large murrini that is 2" high and 2" in diameter. If that large murrini is placed on a flat, level surface and is heated to a liquid state, the liquid would flow outward from its original footprint until it spread out far enough to only be 1/4" deep. It is the same for an ice cube left on a counter to spread as it melts as its viscosity is dictated by its temperature from ice cold to room temperature.

Mass

Imagine again the 2" high and 2" in diameter murrini being heated, but this time imagine that it is surrounded by a ring of murrini that are each lower in their individual mass (ie. each murrini is ¼" high and ¼" in diameter). The result would be a tsunami created by the larger murrini, as it becomes a liquid and flows outwards to find its consistent 1/4" depth, which pushes over the smaller forms. The tube-like cylindrical structures of the smaller surrounding ring would radiate outward from one central origin, the center of the highest mass (as seen in Fig. 1). This radiating pattern is similar to linear perspective where all parallel lines

converge visually as they approach infinity and a technique used in other media to achieve single point perspective. This is one way in which I use the physical characteristics of the glass to force the brain to perceive depth and perspective.

Fig. 1. High mass center creates radiating tsunami.

Gravity

Imagine for one last time the single 2" high and 2" in diameter murrini being heated but this time imagine it melting on an unleveled surface. The liquid would still flow but rather than flowing equally in every direction, the glass would flow more in the direction pulled by gravity, or, to simplify, it would flow downhill; this is the effect of gravity shown in the glass (as seen in Fig. 2). When working with multiple pieces of murrini, all of the murrini are affected by the same directional pull of gravity. The murrini can be pulled far enough that they overlap neighboring murrini and create a "stacked" effect. This overlapping is another way by which I induce the feeling of distance and depth by mimicking the way the brain reads objects that overlap as being at different distances from the viewer. I can make the angle of the melting surface consistent or different when melting different panels, which allows me to compare the direct result of this variable. This ability to decide the angle of the firing surface for each panel allows me to use the angle of the surface as either as a control or variable.

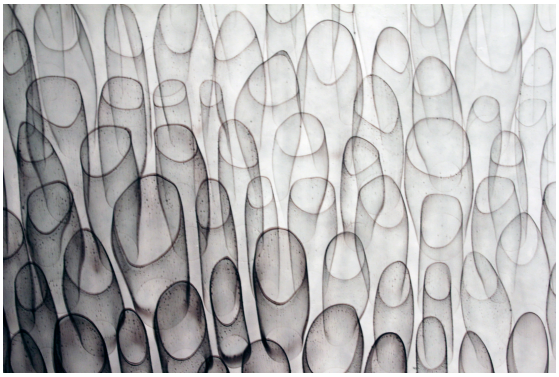


Fig. 2. The uniform pull of gravity.

Time

Time allows for the results of factors such as heat, mass displacement or gravity to be minimized or amplified. Consider the liquid glass on an unleveled melting surface described above. If it remains at the temperature too long, the glass will slowly flow over the edge of the melting surface and collect on the bottom of the kiln (yes, at a depth of 1/4"). The effect of too much time can also affect color and chemistry as certain fluxes can vaporize at higher temperatures. Being that time is easily measured, it can also be used as a consistently repeated control or a changed variable when melting my murrini panels.

Chemistry: Physical and Aesthetic

The chemistry of the glass is a variable with which I try not to drastically alter in my glass process. To maintain similar characteristics of the glass, I only use one type of glass in my artwork thereby ensuring physical chemistry to serve as a control in my process. This is because each type of glass (ie. Spectrum's System 96, Bullseye, etc.) could potentially have a unique chemistry with different aesthetic properties (ie. color) and physical properties (ie. melting temperatures and rates of expansion). It is critical to know the physical properties such as rate of expansion of the glass used when fusing glass to avoid cracks in the glass while it contracts and cools to room temperature. To avoid this issue, I use only one type of glass.

While I only use Spectrum's System 96, which ensures physical chemistry as a constant, I experiment quite a lot with the aesthetic chemistry (ie. color saturation and density) by adding varying amount of colored glass when making my cane. The "color" is glass with slightly different levels of certain metal oxides and, although it slightly changes the chemistry of the glass, the physical properties of this glass are similar enough to avoid physical problems. The process of making my cane, in which color is added to the surface of the glass, encased and then stretched into a long cane, allows for variance in the density of color. For example, if I were to apply a very dense layer of color when making the cane, the result would be a very dense color in the final murrini. I could also vary density by stretching the length of cane further forcing the layer of color to stretch thinner to yield a less dense layer of color in the murrini. I use these methods to create murrini that ranges in density from opaque black to nearly transparent light grey. In order to compartmentalize and organize this color range, I sort all murrini into seven separate tones from black to nearly clear, which allows me to arrange murrini by color density to create a gradient in my work.

Gradient: Atmospheric Distortion

Gradients from dark to light mimic how the brain perceives depth and distance in two ways; the first way is called aerial or atmospheric distortion which occurs when objects seen far in the distance have a lower contrast, color saturation and less detail when compared to objects closer to the viewer. Consider standing on a gravel road that stretches far to the horizon. The objects closer to us, such as the gravel by our feet, seem clear and full of detail but as the eye moves farther along the road, detail become lessened due to the scattering of light in our atmosphere.

The longer the distance between the viewer and the object, the more distorted the view of the object becomes. In my work, the gradient of the more saturated darker murrini at the bottom that gradually become lighter at the top mimics this phenomenon similar to how the brain recognizes distance while viewing a landscape.

Gradient: Light and Shadow

The second way that I use a gradient of dark to light murrini to create a sense of depth is to mimic the way in which light and shadow fall on a curved surface. Consider a cylinder that is well lit from one side. The side closest to the light source is bathed in light and the opposite side is dark with shadow. In-between there is a gradient from light to shadow that is created which allows the brain, even in monocular creatures such as squirrels and fish, to recognize the surface as curved (as seen in Fig. 3.1). A gradient in my work (as seen in Fig. 3.2) provides false clues to the brain to imply a false depth in which the known physical flatness of the work becomes misread as curved. Because I dictate both how I make the murrini and how I arrange it on the melting surface, I can control this gradient and use color density in my work either as a control or as a variable.

Fig. 3.1 Cylinder lit from one side.

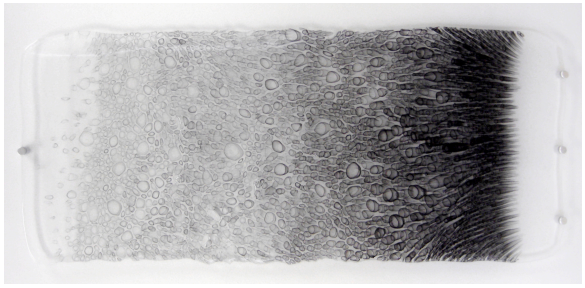


Fig. 3.2 Gradient to mimic light on a curved surface.

Relative Size

Another way by which the brain reads depth is by comparing objects of relative size and using this information to deduce distance. When objects of similar size are at different distances, the brain recognizes the closer object as larger than the object that is farther away. By repeating the "tube-like" forms in the murrini, the brain reads the forms as being similar objects in size but at different distances from the eye. I mimic the difference of relative size that the brain uses to recognize objects at different distances purposefully by arranging the murrini to be larger at the bottom of my panels and gradually get smaller toward the top of my panels to reinforce the sense of depth in the viewers' brains.

Perceived Depth

The depth perceived in my work by the use of perspective, color density and size is important as it creates a conflict between what the viewer knows about the physical characteristics of the work and what they see in it. The physical thickness of each panel is very thin at 1/4" and yet seems to be very deep, visually. This same conflict can be found in other flat media such as drawing, painting, photography and video. All of these formats are influences of mine and I look to them for ways in which to create a perceived depth.

Repetition

My glass panels are arranged by repeating the modular units of murrini. Each of the murrini forms is similar in shape when arranged on the melting surface but change as they are heated to a liquid state. In this liquid state, the forms are distorted due to the variables placed upon them. This unit is repeated over and over again to show how the different areas of mass react differently while a liquid. The whole is made more interesting by repetition of the individual. The individual cylinder forms (as seen in Fig. 2) appear as if something other than what they are and give the illusion of being a different scale. The forms take on a different identity ranging from a bubble, a bowl, a vase, a pillar, a tower.

Interaction

Before studying at RIT, my work was typically made up of one glass panel displayed on thin, black metal frame. The goal of this display was to show the work in the simplest way possible, but as such, the viewer had very little interaction with it. As part of my thesis exhibition at RIT (the pieces of which are shown later in this thesis), I wanted to rethink how I displayed my artwork and how the viewer interacted with it by making the artwork more complex than a simplified two-dimensional panel, by creating large artwork that encompassed the viewer, by eliciting a taboo response to surface quality, and by making the viewer feel contrasts of calm and tension.

When displaying thin panels of glass on a stand, the viewer can walk around the piece to view it from any angle. Upon looking at the broad, flat face of one of my earlier pieces, the viewer experiences the work by seeing its false depth of delicate forms and movement. If they were to travel around the piece, they notice that it is less interesting when looking at the profile of the panel where only the ¼" edge is visible; *About* challenges this. *About* is a two-panel piece in which the each panel of glass has been distorted from its flat, two-dimensional beginning to create raised tabs that pierce through the plane of the other panel of glass (see images of *About* and other pieces beginning on page 19 of this thesis). When the viewer sees the "face" of *About*, they see a panel of white murrini with a gray tab stabbing through it. This initially elicits confusion in the viewers, who is unsure what they are seeing. As they travel to the profile view of the piece, they better understand how it is accomplished and are better informed to understand the next "face" of the piece, which is the gray panel, pierced by the white tab. The viewer does not just simply look to the glass the same way in which one would view a painting but is forced to

examine the piece from all sides to better understand it. In this more complex viewing ritual, *About* is much more sculptural than my earlier work.

Force is a large 7 feet by 3 feet (86" x 36 ¼") glass panel that was secured to the end wall of the gallery at eye level. *Force* allowed the viewer to get very close to examine the delicate murrini structures thereby encompassing their entire field of vision with its impressive size. This piece invites the viewer to be removed from the gallery and inserted into a setting made by the artwork, changing how the experience it from object to environment. Typically in the past, viewers would look at the object only and this is a dramatic change in the interaction of the viewer with my work.

In the case of *Swell*, the viewer is presented with a bumpy, rounded glass object securely displayed horizontally on the top of a pedestal. The surface of this piece looks smooth and sexy, creating a desire to touch the surface even though touching artwork in a gallery is considered strictly taboo. An internal conflict of right versus wrong, to respect the art or to sneak a tactile experience, develops within the viewer. Typically, the viewer gives in to their desires and runs a hand over the surface, adding a completely different sense to their experience, the sense of touch. This is another way in which I changed the gallery experience from that of viewer to that of participant.

As mentioned, the panels melt to form a very thin panel of glass due to their viscosity and surface tension and as a result, are thought to be very fragile. Viewers bring their own experiences to the work and typically, the most experience with glass is of breaking a mirror or dropping a glass cup. People bring fear to any glass art exhibition. By creating work that plays with this fear, one controls how they interact with it. In the case of *Detail*, the viewer sees a series of squares 4 ½" x 4 ½" secured linearly at eye level to a allowing the viewer to approach the work very closely to examine the detail and depth found within. This is different than how they typically see the entire work as a whole when examining an entire panel on a simple black stand. As they move from left to right to examine each square, they begin a repetition of activity which forms a sense of calm that is reinforced by the delicate structures found within the glass forms. This sense of calm is interrupted when their peripheral vision sees a large panel seemingly precariously leaning against the wall (when in fact the panel was very secure) that they are about to knock over if they continue to move to the right. At this point the viewer is filled with a sense of tension as they remember their previous glass experience of the broken mirror or cup. This experience is a drastic departure from the viewer just seeing my work and interacting with it only visually.

INFLUENCES

The processes of photography, drawing and painting are influential to my work. However, I am more inspired by the technology of how depth is achieved within these methods than the artists who use them. All three methods are flat but all have the ability to show depth; I often borrow and simplify this premise in my glass artwork.

I am not aware of any glass artist who makes work similar to mine, but the underlying glass technique that I use has a strong foundation in the history of glass. The murrini process is believed to have begun more than 4,000 years ago by Venetian glassmakers in Murano, Italy, in the early 16th century (Carl 37). Although murrini can be made with almost infinite variation, I make a very basic and simple murrini in order to emphasize the movement and shape of the murrini in the final fused panel with minimal distraction.

Grounded in my foundational education in Studio Arts, the artists who tend to influence my process and artwork are minimal artists from the 1950s and 1960s such as Frank Stella and Sol Lewitt. Their decisions when simplifying their work to basic elements and their systems of organization have greatly influenced my work.

I find that Frank Stella's Black Paintings made early in his career influenced the simplification and color of my glasswork. Stella applied parallel bands of black enamel paint in various symmetrical configurations with each stripe separated by a thin line of unpainted raw canvas (as seen in Fig. 4). Stella uncomplicated the act of painting to a dramatically simplified and repeated line element that he used in a very straightforward way. In a 1964 radio broadcast, Stella said:

> "All I want anyone to get out of my paintings and all I ever get out of them is the fact that you can see the whole idea without any confusion … What you see is what you see." (Rubin 60)

I also have tried to simplify my work throughout my career and it is this simplification process that has evolved my work into its current physical and aesthetical state. One of the easiest ways to simplify, for both Stella and for myself, was to remove color from the piece. The use of black may have some conceptual baggage but if used to just produce a form, it is the simplest version of that form visually. Stella's series of Black Paintings had a restricted color palette that made them uncomplicated and easier to experience. In later years, Stella created similar paintings using vivid colors but I find these paintings to be less effective and more complex to the point where I like them less. Once Stella introduced color, he also introduced depth as certain color combinations forced the colors to advance and other to retreat. One would think that this seemingly less flat body of work would be more closely related to the illusion of depth that I try to achieve but the paintings serve more as reminders not to do the same.

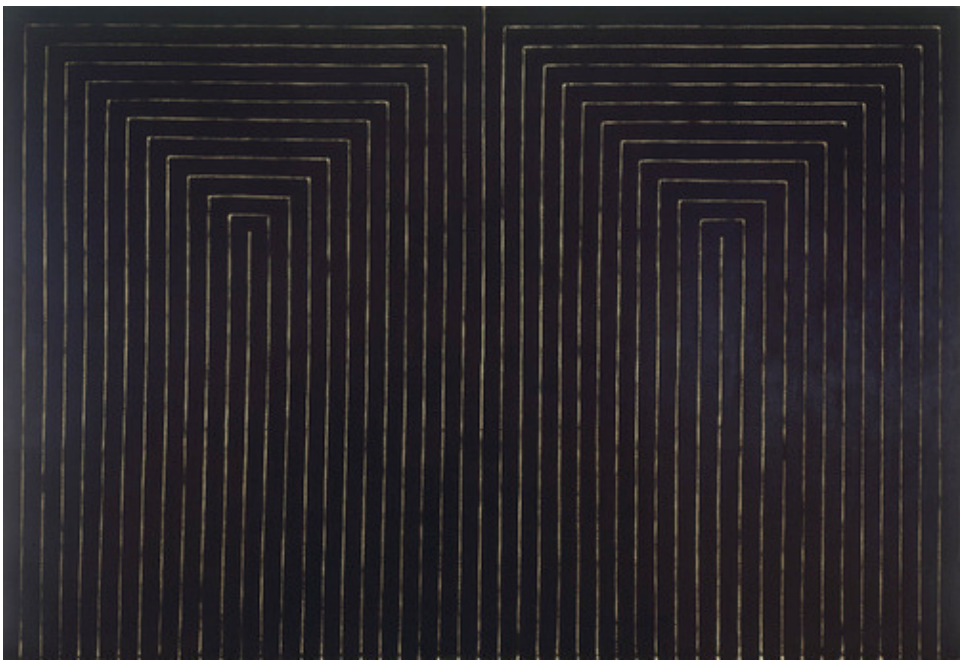


Fig. 4 Frank Stella. The Marriage of Reason and Squalor, II. 1959
Enamel on Canvas. 7' 6 3/4" x 11' 3/4"

The artist for whom I have high regard and who has encouraged my experimentation with techniques of creating depth is Sol Lewitt, particularly his later series of Wall Drawings. Lewitt was well known for his drawings created directly on the wall surface that he started in 1968. By drawing directly onto the wall's surface, typically used as a support for whatever intermediary surface on which the drawing was completed, the wall became an integral part of the drawing. By removing the substrate being hung onto the wall, the works could not be more physically flat to the wall's surface yet Lewitt was able to create much visual depth.

The example that is most similar to my work is the Scribble wall drawing series that Lewitt began in 2005 (as seen in Fig. 5). The Scribble series employed a team of draftsmen to apply graphite to the walls using a scribbling technique that occurred at six different densities, which are indicated on the artist's diagrams and then mapped out in string on the surface of the wall. The gradations of scribble density produce a continuum of tone that implies three-dimensional depth.

Fig. 5 Sol Lewitt. Wall Drawing 1185. Scribble. 2005. Graphite.

Even though I did not see these Scribble wall drawings until I was already well established in my depth-inducing process, Lewitt has influenced other areas of my process from the beginning. Whether in printmaking or in glass, the way in which I approach my work has always been to simplify and experiment with the process in order to observe and compare the results. Lewitt is possibly the best-known example of simplifying artwork down to an almost mathematical process. In his series of Modular Structures (as seen in Fig.6), Lewitt simplified and subtracted from his earlier forms by removing the skin to reveal the structure depicting the volume of a cube. He reproduced and grouped this skeletal cube of information in differing sequences. A simple idea made complex by reproducing patterns of a simplified, modular unit.

My work is made up by groupings of a single reproduced unit, similar to both Stella and Lewitt, and arranged in an organized manner. One major difference between our works is that I allow the phenomenology of the material to act on its own as only it could, under the specific variables that I place onto it, usually that of varying mass density, unleveled firing surfaces and a range of tone. Like these two Artists from the past, my work is also simple made complex by repetition. The repetition of Lewitt's modular cubes into groups creates a perfect example of how the human brain sees depth by perspective. Lewitt's Modular Structures are made up of parallel lines running in all three planes to make up a stack of open cubes. As the viewer looks at the structures, the lines converge towards a single point as seen in single-point perspective. It is stunningly complex yet very simple. It is depth

created by actual physical depth, but it still has had a very impactful influence on how I try to achieve depth in my work, effects that I am only able to show in my work by repeating a simplified modular unit to best show the results.

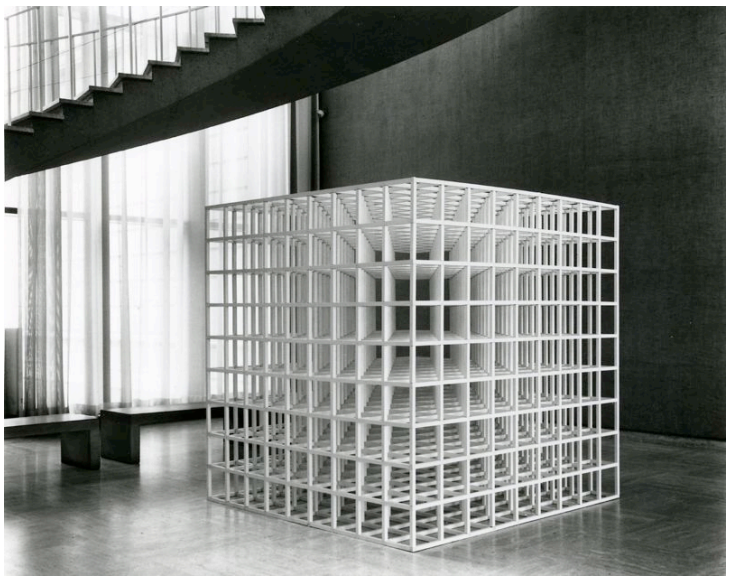


Fig. 6 Sol Lewitt. Nine-part Modular Cube. 1977
Baked Enamel on Aluminum. 86 1/2 x 86 1/2 x 86 1/2 in.
Source: http://www.artic.edu/aic/collections/artwork/54229

In his Paragraphs on Conceptual Art, Lewitt states:

> "When an artist uses a multiple modular method he usually chooses a simple and readily available form. The form itself is of very limited importance; it becomes the grammar for the total work. In fact, it is best that the basic unit be deliberately uninteresting so that it may more easily become an intrinsic part of the entire work. Using complex basic forms only disrupts the unity of the whole. Using a simple form repeatedly narrows the field of the work and concentrates the intensity to the arrangement of the form. This arrangement becomes the end while the form becomes the means." (Garrels 369)

I have simplified the structure of the murrini to a repeated presence throughout the work and by doing so the depth achieved does not compete with the individual forms that create the depth. I have chosen to use the most basic and simple form, the grey tube-like murrini, to emphasize the theme and concepts driving the work. The only unit of information that could be simpler is a solid core of color within the murrini, which I have found to be too simple to successfully induce the feeling of depth. A solid core only shows directionality of movement and does not best yield information to create visual depth due to overlapping, color saturation, and distortion due to arrangement of different mass densities. This simplified modular unit is grouped and arranged specifically to create artwork that I consider successful.

CONCLUSION

While I am not a trained scientist, I enjoy building scientific thought and theory into my artwork process to create a refined aesthetic quality in the work. By controlling specific variables while isolating and experimenting with others, I am satisfying an inner need to categorize and organize. By controlling variables such as viscosity, mass density, gravity, time, and arranging the murrini by color density and size, I have built an intimate knowledge of glass from which I can better achieve a desired visual effect of a perceived depth. I use this knowledge to create a visual depth far exceeding physical limitations.

Glass performs predictably when specific variables are isolated. I utilize viscosity and time as controls in most of my experiments and mass density, gravity and arrangement based on color density and size as variables. The material's predictable resistance to flow, or viscosity, allow me to adjust the mass of the murrini components that fuse together and displace one another as the liquid glass equalizes. This push and pull can mimic how we see parallel lines diminishing at a single point on the horizon, found in single-point perspective. Gravity allows the glass to flow in a uniform direction and overlap other murrini stimulating the brain to perceive depth by seeing each form with great distance in between. I reinforce this perception by arranging the forms in a gradient from light to dark. This gradient creates a false sense of atmospheric distortion where objects seen from far away have lower contrast and color saturation than those seen up close. The gradient also mimics the way in which light falls on a curved surface, which even monocular species use to recognize a surface as curved. I also arrange my murrini components by size, mirroring the brain's recognition of larger forms typically being closer than smaller forms. All of these variables are employed to create contrast between what the viewer knows to be true (ie. that the panel is only ¼" thick) and what is perceived to be true (ie. that the panel seems to have great depth).

These methods of creating depth are similar to those found in my general influences in photography, drawing and painting. I am influenced by all three of these artistic media, as they all they create the illusion of depth; however the art of Frank Stella and Sol Lewitt have been particular favorites. Frank Stella for his seemingly simplified and flat early paintings and Lewitt for his early simplified and repeated forms and for his later wall drawing of seemingly endless depth.

By utilizing what I have learned from many years of rigorous experimentation, I have created varying ways in which people interact with my work and I am able to challenge their ideas about how glass art can be compared to the traditional artistic traditions of painting, drawing, photography and sculpture. I am still inspired to experiment with glass, as I continue to be inspired by flat techniques and practices. Since my MFA exhibition in 2010, I have continued to experiment in the medium of photography, using my glass panels as negatives to create photographs in the darkroom (which I discuss in greater detail in the Epilogue).

BODY OF WORK

My Master of Fine Art exhibition was held in Rochester, New York at the Booksmart Studio gallery in April of 2010. The show featured seven pieces of my glass artwork in a gallery space that was 16' wide and 45' long. The resulting work of my studies yielded a thesis exhibition that explored perceived depth and the way in which the viewer experienced the work. The pieces in the solo exhibit also featured a few common themes such as material, a grayscale limitation of color, a gradient of tone from light to dark and the refusal of function in a traditional glassware sense. Utilizing the information provided by experimenting with variables and controls placed on each process made the creation of the work easier. The results of this experimentation were made easier to observe by simplifying the structure of the murrini and reproducing it as a modular unit.

About

About
Glass on Metal stand
22" h x 16" w x 4 ½" d
2010

About is comprised of two fused glass panels, one gradient grey murrini panel and one white murrini panel, held vertically by a black stand made of 1/8" and ¼" metal rods. Both panels are rectangles measuring 20" h x 12 ½" w with vertical tabs in the shape of a square letter "U" that was water-jet cut into the center of each panel. The panels were then placed over or mold in a kiln and heated to 1,250°

Fahrenheit (680° C). This temperature is high enough to soften the glass but not high enough to liquefy it. Gravity pulled the softened glass until it reached the mold form where it was supported from moving further. To create both panels of *About*, I placed each over a mold that supported the outer three inches of the perimeter but allowed the center tab of the panel to gently fall roughly 15 degrees from the original location. The panels are held inverted from one another with their center slumped tabs facing and interlocking with one another. The tabs each insert into the other panel's void that is created by the other panel's relocated tab. The panels stand parallel to each other with the center of each panel crossing over and through the other. The panels are exactly the same shape but opposite in color and orientation. The piece was held up to the viewer on a narrow plinth that was wider than the base by only 1" on each side to further emphasize the tabs by allowing them to stand wider than the plinth.

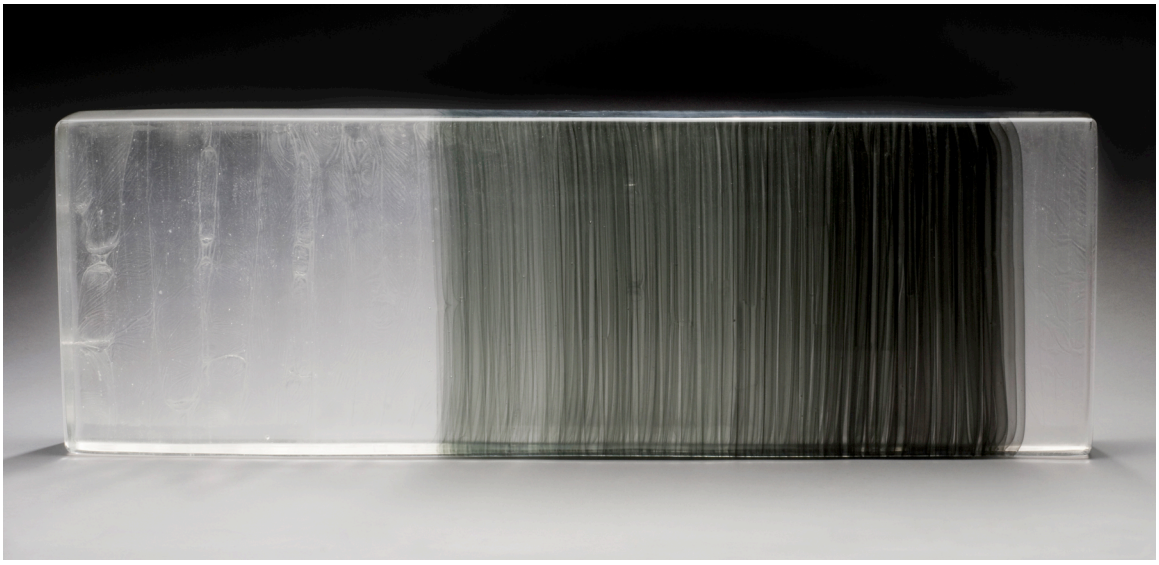
Three views of *About*.

This piece was created to improve upon what I felt was the greatest shortcoming of my previous work: the lack of opportunity presented when looking at the side of my panels, as aforementioned. With *About* I attempted to make every viewing angle interesting, and wanted to force the viewer to experience it from 360 degrees as a three-dimensional sculpture. Becoming more interesting as the viewer travels around the piece was directly influenced by sculpture in which the art requires the viewer to spend more time experiencing the piece and builds as the viewer sees it from multiple angles.

The title *About* was in reference to how I was experiencing my time as a foreign student studying for my Masters degree in a new country. My expectation, initially, was that it would be very similar to my home as I was a mere three-hour car ride away. I was actually the closest to home in Rochester than any of the other graduate students in the glass department; however, I was considered the "international" student. Over the two years that I lived in the United States, I noticed

many differences. One difference was dialect. I personally did not notice much divergence in how I said “house” or “bagel”, but my American friends were sure to point out this discrepancy each time I said the word. Then, when I returned home during my second year of graduate studies and said the word “about” to my Canadian friends, they too noticed a difference in my pronunciation. I was no longer pronouncing words as a typical Canadian, and yet, I was not pronouncing them as an American. This piece is about feeling like I was almost fitting into two separate places while being aware that I was not fitting into either.

Cross Grain



Cross Grain
Glass
10” h x 30” w x 3” d
2010

Cross Grain is a 10” h x 30” w x 3” d thick slab of fused cane that was ground and polished on all sides except for one of the long faces, which yields a rough texture. The clear glass slabs broken by a core of cane that varies in color density from light to dark to create a tonal gradient. This piece is different from the others in the exhibition in that it was made in a mold and therefore contained as a liquid, whereas the other pieces were made on a flat surface, which allowed for their dimensions to be dictated by viscosity and surface tension. *Cross Grain* was made by placing 10” long clear and gray canes into a mold and melted at a temperature of roughly 1,650 degrees Fahrenheit.

I wanted to experiment with the dimensions of my work to see how the variable of actual dimension affected the viewer’s experience. The typical glass panels that I make are usually ¼” thick and *Cross Grain* was much thicker. This

changed the way the viewer interacted with it. The piece was much heavier and the piece was displayed on a pedestal just above hip height to emphasize this. The viewer was made to feel at ease approaching it, unlike the other pieces that seemed fragile in comparison.

The surface treatment of *Cross Grain* was different from my other work. I ground five sides to a near polish, leaving one long face exactly as it came out of the kiln. I left this surface to show the texture of the stacked murrini as they melted together which looked like a combination of alligator skin and ocean waves as seen from a great distance above. It was left rough so that when the viewer gazed into the piece, the viewer was made very aware of the back surface, rather than not noticing it at all. This awareness of the back surface made the viewer aware of the actual depth of the piece and did not try to mimic a false depth.

The direction of the cane in *Cross Grain* was different from my other work. Rather than looking into the cross-sections of the murrini typically found in my work, I left the cane 10" long and stacked them so that the viewer could see along the side of the cane, rather than into its interior. This was done to emphasize that the work is thicker (1,200% thicker than most other panels) than the rest of the work in the show. The sideways stacking of the lengths of cane and the rough texture left to reveal the back surface emphasized the actual depth of the piece without the illusion of depth. This contrasted the other work by appearing precisely as thick as it actually was and was included in the show to be a literal result of changing the variable of the ¼" thickness created in my other work by the viscosity and surface tension of the glass.

The focus of this piece lies in the very subtle movement of the shifting rods of colored cane and also in the contrast between flat, finished surfaces and the remaining texture on one side. This texture was so interesting and added patterns similar to that found in wooden furniture, especially the quarter sawn white oak found in the work of my favorite furniture maker, Gustav Stickley.

The title was inspired by the woodworking term "cross grained" which is defined by Collins dictionary as wood having the fibers arranged irregularly or in a direction that deviates from the axis of the piece. This is in reference to how the positioning of the presentation switched due to the direction of the fibers within. The term can also reference something that is cantankerous and stubborn which relates to both the piece and its maker in this inference. The piece was stubborn in its ability to withstand more than 40 hours of grinding and my stubbornness to continue grinding it for that long.

Arc

Arc
Glass on Metal Stand
18 ½" h x 13" w x 11" d
2010

Arc is comprised of five parallel water-jet cut, fused glass panels that are each 18 ½" h x 13" w x ¼" d presented together, displayed with 2" of space between each panel. The panels each have a band of similar murrini running horizontally from edge to edge and are at different heights in each panel. The panels are held in place by metal running vertically along one side and horizontally along the bottom of each panel. The idea for this stand was to be minimal and disappear and to also show a more scientific feeling that references something seen in a slide laboratory. This was a nod to my love of science through the display of my art.

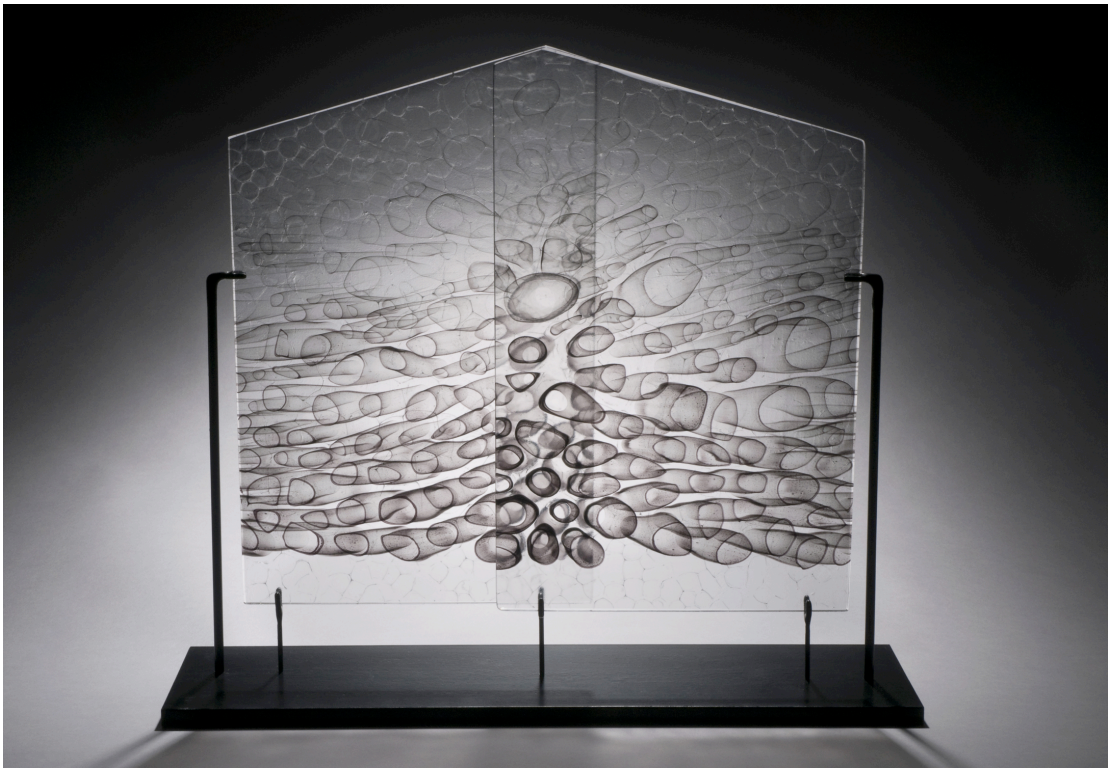
This piece was inspired by how a scientist would view the path of motion an object travels through space. For example, when a ball is thrown into the air at roughly a 45-degree angle, it follows a curved arc as it rises in altitude, peaks and falls as gravity acts upon it. If one were to draw this trajectory, it would form an arc in space, which is the inspiration for the title. I took this theoretical trajectory and divided it into five parts and compressed it using the illusion of compressed depth found in my panels. The angle of the murrini forms rose steeply in the first panel, started to approach level in the second, peak and travel horizontally in the middle panel, start to fall in the fourth panel, and finally, fall steeply in the last panel. I created the five panels by changing the variable of the surface angle in order to

make the murrini show this trajectory. I positioned each melting surface at different angles while at a melted state in the kiln, from steeply unleveled, to a slight angle, and finally level. The angle dictated how much the murrini would travel in each panel, thereby achieving the desired angle of the trajectory in the finished work.

While all of this is occurring in cross-section, the effect is very different when looking through all five of the panels at once. From this viewpoint, the murrini within the panels begin to stack up in tone and create a gradient when looking through all five panels at once. This gradient is made up in a very different way from the rest of the work in the show in that it is made from the same tone of murrini rather than altering the color density. All five panels are made up of the same clear and dark grey murrini but the information of the subsequent panels is weakened slightly by the panel in front. Each panel acts as a filter slightly blurring the panels behind, but, when viewed together, distinctly show a gradient similar to my typical body of work. The overlapping of these five panels reminds me of the overlapping layers involved in printmaking where multiple layers are used to make the image more complex and interesting.

The stacking of the glass also relates to of the way in which the brain sees objects at a distance with less detail and less color saturation due to atmospheric distortion where the atmosphere scatters light. This loss of detail and saturation in *Arc* is due to each panel having a back surface that is not perfectly flat. This is the side that was in contact with the melting surface and as a result, picked up its slight surface texture. The effect is a slight haze when looking through each panel and is present in all of my works but is usually not emphasized as it is in this piece.

Separation



Separation
Glass on Metal Stand
17 ½" h x 19 ½" w x 5" d
2009

This piece is made up of two murrini panels measuring 15" h x 9½" w x ¼" d that form a simplified silhouette of a house, held vertically by a black metal frame. The two glass panels run offset from each other with an overlap of two inches where they met in the middle of the overall piece.

Visually, the murrini in the center of the piece seem to point directly at the viewer and as the viewer's eye moves outward the murrini tilt and seem to accelerate out from the center. The movement of the murrini stream from the center of the piece and is reminiscent of a science fiction movie depicting distorted stars as spaceships travel at the speed of light. I used the variables of the angle of the melting surface and mass density to create this piece. The panels were fired on an unleveled melting surface, which caused all of the murrini forms to melt in one direction. The arrangement of the mass was greater towards the peak of this surface and gradually lessened farther down. As a result, the higher mass stretched the murrini downward at a steeper angle.

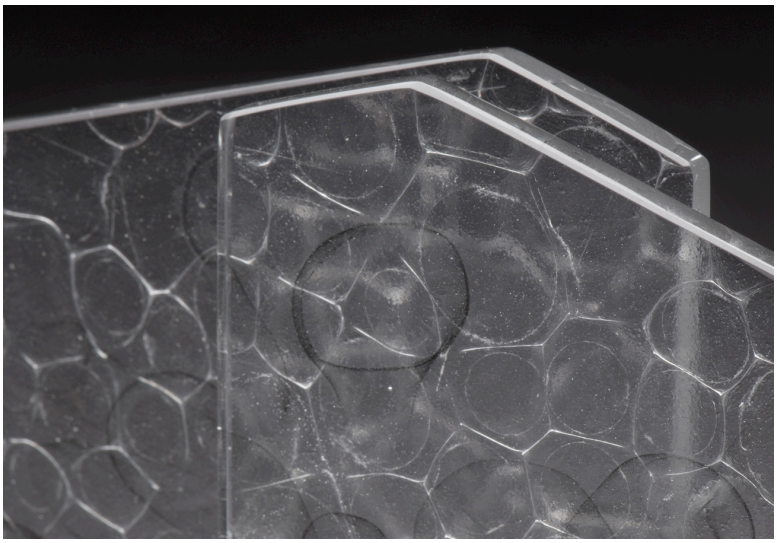
This piece was created with two things in mind, the big bang theory and the divorce of my parents, which happened just before making this piece. The big bang theory, in a very simplified summary, describes a theory about the creation of the

universe as an event that occurred nearly 14 billion years ago when a tight, dense mass that exploded causing all the mass to be hurled in many different directions. This theory had a lot of similarities to the end of my parents' marriage. Both the big bang and the end of their marriage were results from one action that forever changed our universe and just as the planets are still expanding, my family is also growing further apart and redefining our relationships and distance with one another.

Unlike *About* and *Arc*, which have water-jet cut edges, the edges of *Separation* were cut and polished. This is the first panel that I cut to form a shape, before I started water-jet cutting the glass. Once I cut the panels of *Separation*, I noticed that the visual information in the glass was cropped similarly to the way in which the edge of a photograph crops out the world outside its frame.

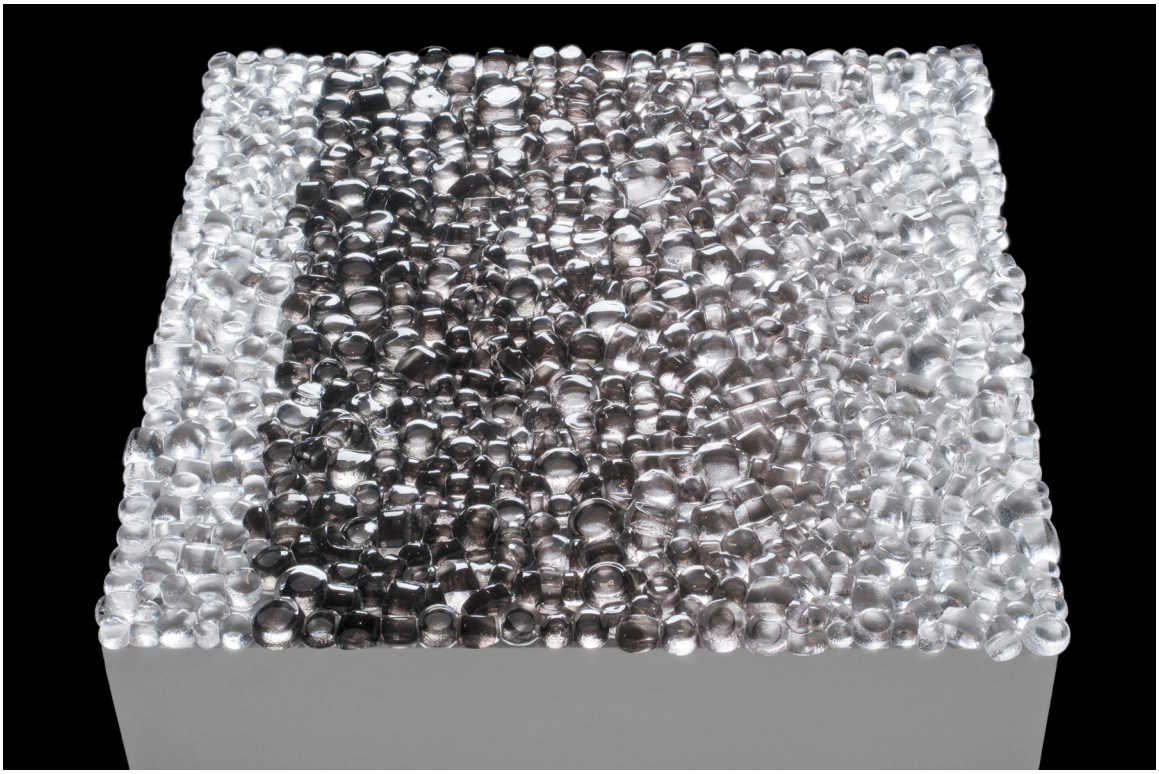
By cutting the edges, information was omitted but the polishing of these edges revealed other information. Once the edges were cut and polished to be clear, the murrini's movement could be seen in another direction. The observer could see a cross-section of the murrini as it moved. The polished edges also show just how thin the panels are and serve as proof to its viewer that the greater visual depth is indeed only perceived.

This piece is part of the Rochester Institute of Technology Wallace Library's permanent collection.



Separation (detail).

Swell



Swell
Glass
½" h 18 ½" w x 18 ½" d
2009

Swell a gradient piece measuring ½"h x 18.5" w x 18.5" d resting horizontally on the top of a pedestal that was slightly narrower at 18" w x 18" d. It has a bumpy surface created as the murrini began to melt but was then halted. When creating this piece in the kiln, I changed the variable of temperature from my usual process and the lower temperature of roughly 1,400° Fahrenheit (760° C), which resulted in a smooth, rounded surface of the murrini. The lower temperature allowed the murrini to melt enough to touch the surrounding murrini but not fully change into a liquid and flow to a depth of ¼". I decided to use the lower temperature to reveal the process involved with creating the work. In preventing the murrini from fully melting to a flat state, it would be easier for the viewer to see the murrini as individual components and better understand how my work is made.

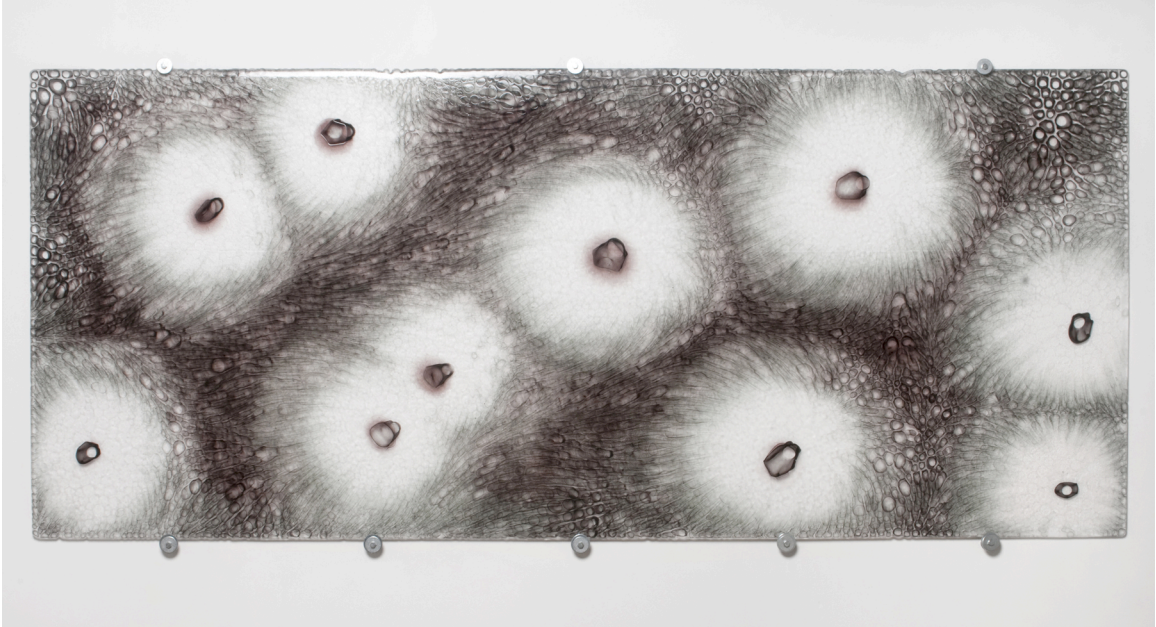
The textured surface of *Swell* was different from my other work in that its surface seemed to tempt the viewer to touch it. My other work is displayed either affixed to a wall or mounted on a metal stand but by showing this piece in a horizontal manner on a sturdy pedestal, *Swell* allowed and encouraged the viewer to fulfill their gallery taboo desire to actually touch it and experience the work with an additional sense. The addition of the viewer's touch allowed them to utilize a different sensory vocabulary with which to describe and understand the piece. This textured piece also literally deviated from the two-dimensional influences of my

work in that it was more three-dimensional than my typical work. Textured influences such as cable-knit textiles and forms found in nature affected this work. The bumpy surface also acted as multiple lenses magnifying the surface of the pedestal and focusing the lights into tiny hotspots. The side of the pedestal was also treated to a licking of light being refracted and aimed down the side of the pedestal like tiny knife blades stabbing into the shadowed side of the upright form. In this way, *Swell* utilized the light in the space differently from other pieces.

The bubbly form of *Swell* created a visual metaphor, as it seemed to flow up from within the pedestal and was halted just at the point of overflowing down the side. It is this swell from below that gives the piece its name. *Swell* seems both static and sturdy in its presentation on a firm pedestal, yet potentially kinetic in that it seems as though it could drip down to the floor and any moment.

Detail of *Swell*.

Force



Force
Glass
36 ¼" h x 86" w x 3/8" d
2010

Force is the largest piece in the exhibition measuring and supported by five mounts spaced 1" from the wall to allow light to bounce off of the white wall behind it. The piece has ten large dark murrini placed in random locations throughout the panel that are surrounded by a ring of clear that gradually transitions through grey to black. By changing the usual arrangement of murrini, *Force* results in gradients radiating around center points rather than a linear gradient from end to end and therefore seems more organic rather than linear and rigid. As the gradients radiate outward, they collide with the gradients forming around the other centers and remind the viewer of how multiple drops of water ripple on the surface of a puddle and collide with one another. This was the initial idea of the piece, and allowed me to change the format of the gradient to see if it changed the way the viewer experienced depth in the work.

The large scale of *Force* allowed me to push the lengths by which I stretch the murrini by increasing the difference in mass density of the murrini within. Having a drastic difference from very high mass to very low mass dictated this movement and greatly stretched the murrini in the process. Some of the murrini were forced to stretch well over six inches and some areas could show up to five or six layers of overlapping forms. This drastic movement was only possible in a piece of such massive scale and added a painterly feel of the piece. The monumental scale of the piece, as well as the hanging of it on a wall served to reinforce this connection to painting. To make a glass object of this scale is very difficult outside of a factory setting but this scale is common in the world of painting. The scale of this piece is

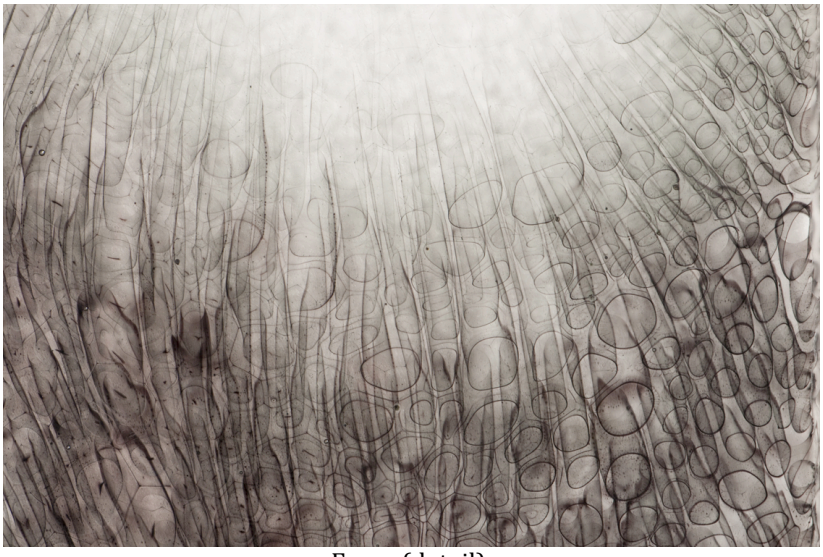
important, as I wanted the viewers to see only this piece and nothing else when they stood close to it. The intent was to create something so large that it became all that the viewer could see, even in their peripheral. To the viewers' brain, *Force* becomes a separate environment into which they could step.

Abstract expressionist painter Mark Rothko experimented with scale in his own work. He once said:

> "I paint very large pictures. I realize that historically the function of painting large pictures is painting something very grandiose and pompous. The reason I paint them however, - I think it applies to other painters I know -, is precisely because I want to be very intimate and human. To paint a small picture is to place yourself outside your experience, to look upon an experience as a stereopticon view or with a reducing glass. However you paint the lager picture, you are in it. It isn't something you command." (Lopez-Remiro 74)

This was the very thought of making something large in my case as well. The viewer could fill their entire scope of gaze by standing a few feet away from the piece. It became all that they saw and encompassed them into a false environment once I lured them close to see the forms up-close. I also decided to make a large work as the Glass department at Rochester Institute of Technology had a kiln large enough to accommodate making such a large panel. The scale not only changed the thoughts of the viewer but also how I approached the work.

Making a very large panel required a seemingly never ending supply of cane and time to sort, chop and arrange in the kiln. It forced me to think differently about how to create something that I felt very comfortable creating. I was forced to rethink each step in creating but also in the steps following its creation such as coldworking, transporting and displaying the final fused piece.



Force (detail).

Detail

Detail
Glass
6' h x 9' w x 4" d
2010

Detail is made up of nine 4½" squares stretch equally spaced across the twelve-foot expanse of the west wall of the gallery, organized in order from light grey to dark black. The squares are held in place by very thin wire supports and are situated above a 39" h x 18" w x ¼" d gradient panel leaning against the wall with nine square holes from which the squares were cut.

I wanted to create an experience for the viewer as they spent time viewing this piece. I purposely placed this piece in this location so that as the viewers entered the space, they were guided around by strategic pedestal placement of the other work within the gallery space. This guided them to view this piece last, starting from the left side of the piece. I created a pattern with the repetition of the squares on the wall and emphasized this with the gradual shift from nearly clear murrini forms through to darker murrini forms. The effect feels very calming and the viewer begins to follow a pattern as well as they look at one panel, move to the next and look again. This feeling of calm is disturbed as the viewer moves down the line of squares and becomes aware of the panel leaning against the wall. The feeling of calm slowly turns into an uneasy feeling of caution. In truth, the piece was held securely in place but the effect for the viewer is one of calmness to tension as they are reminded of the fragility of the material and their experience with breaking glass in their past.

I also wanted to change what the viewer sees in this work from seeing it as a whole to being introduced to the individual tube-like forms within. I spend a lot of time with the work as its maker and I have a very intimate relationship with it as a result. The movement and shape of individual murrini and depth within a panel often captivate me as I work with each fused piece. My focus jumps around the glass panel as I study the forms that the murrini has become distorted into, before my attention is stolen by another murrini in a different position and pose. This visual taking of inventory seems to last a long time and when I finally force myself to stop, my eyes are usually quite tired and my mind is racing. I have noticed that when I show the work to the public, they are not always as intimately focused on the individual details of the forms and often see the larger overall piece as a whole. By removing and featuring nine of my favorite focal points from the whole, *Detail* enabled me to force the viewer to look exactly where I focused and allowed me to share my experience with them so that they too can understand the work in a way that is similar to my experience.

Detail (detail).

EPILOGUE

Photogram

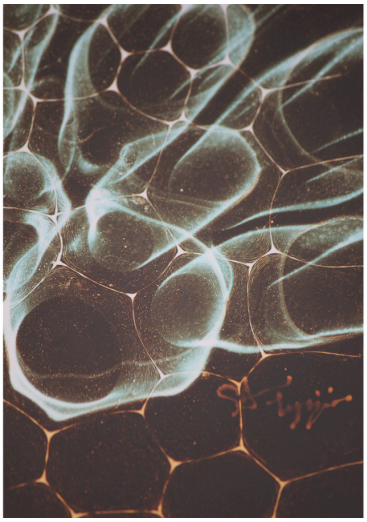
Since graduating from RIT in 2010, I have continued to push the boundaries of my artwork by continuing to experiment. More specifically, I have utilized my glass panels to produce photographic images, thus bringing the same theories and drive to experiment into yet another medium, while providing a direct comparison between photogram and glass panels. The resulting photographic prints ask the question of whether my glass panels are the artwork or the tools to make the artwork, whether the produced photographic print is the artwork or the record of the contact it had with the artwork. All of the above seems to be true.

In short, I am using my glass panels to create photographic version in a photographic darkroom. I place my glass panel directly onto color-photographic paper and expose the paper to light with an enlarger used to print regular film negatives into color photographs. The resulting image, technically considered a photogram due to the direct contact of the negative with the paper during its exposure, is visually a near opposite of the original glass panel. This result is similar to the way in which 35mm film negatives were dissimilar to their resulting prints. For example, clear glass portions of a panel yield a dark black in the photogram that seems to recede from the viewer. Any area of opacity in the glass, such as the grey tube forms reoccurring in many of my panels, become bright highlights as the opacity blocks the light needed to darken the emulsion on the paper. Further, any colored glass murrini result in the opposite color when printed in the photogram due to it filtering the light as it passes through the panel. Many of these results were expected based on my experience and knowledge of basic photography and memories of 35mm negatives.

While the experimentation seems to draw an obvious conclusion that the resulting photogram would turn out similarly to a photo negative, I encountered a few surprises along the way. The biggest surprise was that the seemingly timid edge of the glass is highlighted by a bright white halo due to the edge of the panel being curved and focusing the light away from the photographic paper.

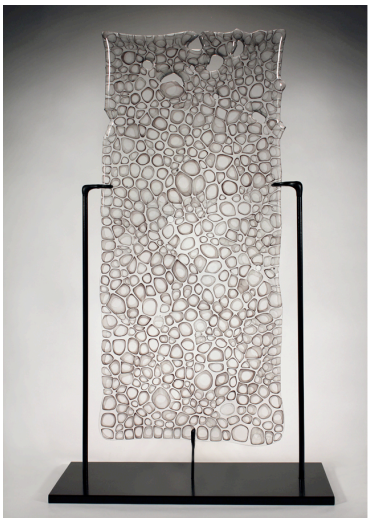
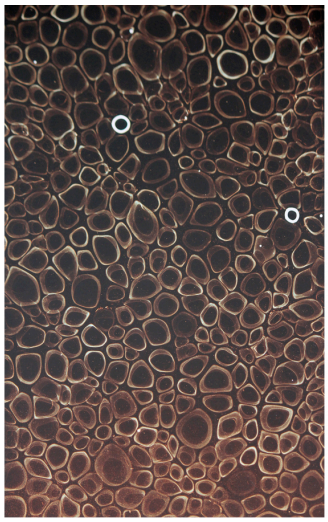
I have been encouraged by this experimentation in the darkroom and will continue to use these results to alter the way in which I create the next generation of my glass fusings. As with my earlier work, I will use this resulting information to make informed decisions for the future glass work and will continue to hold some elements constant (ie. knowing the edge of the panel will be illuminated in a white outline, knowing that clear becomes black, etc.) while experimenting with other variables (ie. other colors, methods of displaying the artwork together, looking to display the photograms on their own, etc.). This new body of work requires a new way of thinking and so far has proven to be almost paradoxical in logic as results in the photogram inspires me to rework the glass and vice versa.

Voronoi

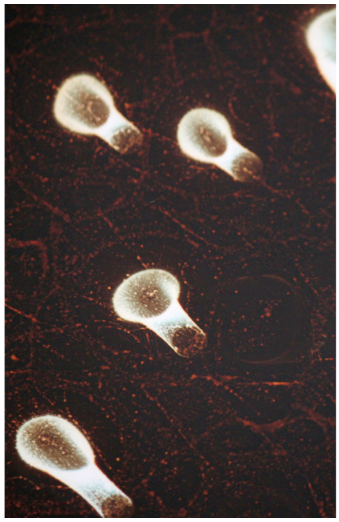

Voronoi
Glass, Photogram detail, Photogram
Glass on stand 22 ½”h x 15 ½”w x 5“d, Photogram framed 31”h x 21”w x ¾”d
2013

Homeostasis

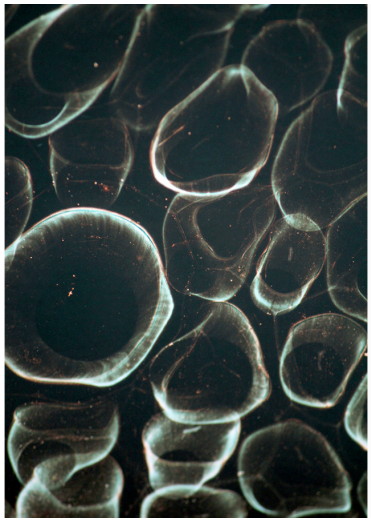

Homeostasis
Glass, Photogram detail, Photogram
Glass on stand 21”h x 12 ½”w x 5“d, Photogram framed 32 ¼”h x 22”w x ¾”d
2013

Pilchuck


Pilchuck
Glass, Photogram detail, Photogram
Glass on stand 21 ½”h x 12 ½”w x 5“d, Photogram framed 31 ¼”h x 21 ¼”w x ¾”d
2013

R54 Gradient


R54 Gradient
Glass, Photogram detail, Photogram
Glass on stand 22 ½”h x 12“w x 5“d, Photogram framed 25 ¼”h x 16”w x ¾”d
2013

Gallery installation view
The Artist Project
Toronto, Ontario, Canada
February 2013

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